

GUEST EDITORIAL

Myth and Reality in Minimal Access Oncologic Surgical Management

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"Diseases that harm call for therapies that harm less."—William Osler

The excitement that began in the mid-1980s about the laparoscopic approach to the gallbladder has begun to encompass many facets of diagnosis and therapy for those of us who manage malignancy in the abdomen and chest. Although it is attractive to believe that many of the traditional approaches we have used can be transformed to minimal access concepts, I believe that we must constantly re-evaluate, especially at this early juncture in the development of these techniques. Perhaps the best way to approach the problem is to think in terms of "Myth" and "Reality" in identifying certain principles and planning for the appropriate use of these techniques.

LAPAROSCOPY WILL COMPLEMENT TRADITIONAL IMAGING TECHNIQUES—MYTH OR REALITY?

It is clear from several studies that the laparoscope will not assume a primary role for the imaging of abdominal tumors but will certainly prove complementary after well-done computed tomography (CT) and ultrasound (US) examination of the abdomen [1]. I foresee that with the introduction of new spiral CT technology and additional developments in magnetic resonance imaging (MRI), the laparoscope will build on these procedures in order to identify small tumor implants that will remain occult with traditional imaging. In staging of gastrointestinal and pancreatic carcinoma, it will become important to add laparoscopic examination in order to plan for appropriate extirpative techniques. The cancer surgeon of the future must be adept at using laparoscopic approaches prior to decision-making relative to surgical care.

LAPAROSCOPIC STAGING OF ABDOMINAL MALIGNANCY WILL BE ENHANCED BY ULTRASOUND TECHNIQUES— MYTH OR REALITY

It is exciting to see the "rebirth" of interest in ultrasound techniques by surgeons. Our European colleagues have been conversant with this technique, especially in the trauma specialties, for many years and now through the introduction of courses for surgeons, the utilization of intra-abdominal and laparoscopic ultrasound has become a reality. Technical achievements in the development of laparoscopic probes, especially with color Doppler techniques, make laparoscopic ultrasound a reality and several studies have already supported the enhanced information gleaned by adding ultrasound to laparoscopic examination, especially in the staging of gastrointestinal and pancreatic carcinoma [2].

LAPAROSCOPY WILL ENHANCE THE STAGING OF ABDOMINAL LYMPHOMA—MYTH OR REALITY?

It is exciting to see the surgeon once more returning to the forefront in the management of lymphoma as the laparoscope becomes a complementary means of performing careful intra-abdominal inspection as well as nodal biopsy and splenectomy in the full staging of patients with Hodgkin's disease [3]. The role of well-done abdominal imaging will not be diminished, but the laparoscope will add valuable information without the need for traditional celiotomy.

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MINIMAL ACCESS TECHNIQUES MAY IMPROVE IMMUNOCOMPETENCE IN CANCER PATIENTS—MYTH OR REALITY?

It has been known for many years that the traumatic secondary effects of surgical intervention will diminish parameters of the immune system. Comparisons between minimal access techniques and traditional celiotomy have already shown major differences when markers of immune competence are measured [4]. Cytokine levels are less elevated following laparoscopic cholecystectomy and colectomy and the ability of the peritoneal cavity to manage bacterial invaders appears to be improved after these minimal access techniques. It is obvious that in patients who are already immunocompromised because of their underlying disease, the methods for treatment which avoid further reduction in immune mechanisms seem to have an advantage. It will remain to be seen whether the advantages gained in protection of the immune mechanisms equal problems relating to the development of port site metastases which may indicate changing parameters in tumor biology relative to the way that cancer is managed through laparoscopic techniques [5].

LAPAROSCOPIC RESECTION MAY CHANGE TUMOR BIOLOGY—MYTH OR REALITY?

Shortly after laparoscopic cholecystectomy was introduced, early reports of the development of cancer growth in port sites were published [6]. These unusual findings resulted from occult malignancies in gallbladders removed presumably only for benign disease relative to cholelithiasis. This early experience has now blossomed into multiple reports showing that growth of tumor cells both in trocar sites and in small counterincisions may be a hazard for cancer patients undergoing laparoscopic techniques [7]. Possible enhancing factors may be related to the creation of pneumoperitoneum with a secondary effect of dispersion of cancer cells that occur when carbon dioxide is released at the conclusion of the operative event or from the constant pressure secondary to maintaining intra-abdominal pressure during a prolonged laparoscopic resection. Perhaps we are dealing with a phenomenon that results from instrumentation itself that will call for constant vigilance by the surgeon to avoid the direct manipulation of tumor. This will also challenge our technical colleagues to develop instruments which create less trauma during mobilization of cancer-containing organs. We must be constantly in tune with good surgical technique in order to avoid hematoma formation in trocar sites which may trap cancer cells in fibrin plugs and thus cause abdominal wall or chest wall recurrences. Carefully done clinical trials and outcome studies should include careful assessment for the possibility of port site recurrence since seeding of the abdominal wound has been a relatively rare (less than 1%) factor in the performance of open celiotomy for cancer resection.

LAPAROSCOPIC RESECTION OF ABDOMINAL TUMORS WILL BE EQUAL TO OPEN TECHNIQUES WHEN STAGING IS COMPARED—MYTH OR REALITY?

Early descriptions of laparoscopic colectomy have recognized the importance of adequate nodal dissection and creation of proximal and distal margins that approximate the principles noted over decades in open cancer resections. Principles of pathologic staging and adherence to adequate nodal dissection as called for in the TNM staging system require that tissue be handled properly and not destroyed so as to make pathological identification more difficult [8]. The challenge for the laparoscopic oncologic surgeon will be to maintain principles of adequate mesenteric dissection when portions of the colon are removed and to strive for adequate margins at all times. Operations for cancer must not be compromised in order to justify a minimal access approach. Clinical trials comparing "open" and minimal access techniques must be rigorous in assessing nodal clearance, margin of resection, and other parameters that will be used to determine the stage of a patient's cancer and the need for adjuvant therapy.

COST OF LAPAROSCOPIC RESECTION OF CANCER IS LESS THAN CONVENTIONAL TECHNIQUES—MYTH OR REALITY?

The overall benefit of creating a minimal incision, both in the chest and the abdomen is realized when the patient is discharged expeditiously and returns to active and productive life, whether that be in the workforce or in other pursuits. Currently, cancer care in the United States contributes to 65% of the total cost of hospitalization while all other nononcologic diseases assume 35% of the hospitalization dollar. In addition, when looking at the overall cost of cancer care in the United States, 65% is spent for hospital stays with a distant 24% used for physician reimbursement. It becomes clear that the greatest likelihood of reducing the global cost of cancer care is to impact on the need for hospitalization and the patient length of stay. Although equipment charges (reusable versus disposable) may play a continued role in the cost equation, by appropriate early discharge planning and returning patients to the workforce in a shortened amount of time, the global cost of cancer care will be reduced using minimal access oncologic techniques.

LAPAROSCOPIC MANAGEMENT OF ABDOMINAL MALIGNANCY WILL BE REGIONALIZED AND LIMITED TO "MINIMAL ACCESS" SURGICAL ONCOLOGISTS—MYTH OR REALITY?

It is my hope that the creation of laparoscopic and thoracoscopic techniques will not fragment surgical specialization further. One may anticipate, however, that certain highly technical minimal access oncologic pro-

cedures such as cryotherapy of liver tumors, colectomy—especially for low sigmoid or rectal lesions requiring abdominoperineal resection, and staging procedures for lymphoma (including splenectomy) may be accomplished more readily and safely in centers that have shown special interest and experience in these areas. It is anticipated that basic approaches to abdominal tumor staging will be taught in residency programs throughout the United States. General surgeons should have a solid grounding in the approach to cancer using minimal access approaches and this may well include palliative bypass using the laparoscope. Current interest in the development of highly structured fellowship programs in laparoscopic surgery will further the development of both technical and research knowledge in these areas and will help to groom individuals who will be the leaders in academic training centers for the twenty-first century.

There are indeed many questions to be answered as minimal access oncologic procedures develop. Some of our concepts may prove to be only myth—some, it is hoped, will prove to be reality and will match and surpass our approaches to cancer performed by traditional open methods. It is my belief that the laparoscope and probably the thoracoscope will become a further means for developing and providing mechanisms of treatment for cancer in the abdomen and chest by serving as a vehicle for

delivering new forms of therapy. We, as oncologic surgeons, may in fact be called upon less to extirpate cancer in the years ahead. Our role, however, will be to remain at the forefront of early detection and hopefully to be the key provider in the development of new and effective therapies that may be delivered using minimal access techniques.

REFERENCES

1. Easter DW, Cushieri A, Nathanson LK, et al.: The utility of diagnostic laparoscopy for abdominal disorders. *Arch Surg* 127:379, 1992.
2. John TG, Greig JD, Carter DC, Garden OJ: Carcinoma of the pancreatic head and periampullary region. Tumor staging with laparoscopy and laparoscopic ultrasonography. *Ann Surg* 221:156–164, 1995.
3. Greene FL, Cooler AW: Laparoscopic evaluation of lymphomas. *Semin Laparosc Surg* 1:13–17, 1994.
4. Kobayashi E, Yoshida T, Yamauchi H, et al.: Immune function in patients undergoing open vs. laparoscopic cholecystectomy. *Arch Surg* 130:676, 1995.
5. Greene FL: Principles of cancer biology in relation to minimal access surgical techniques. *Semin Laparosc Surg* 2:155–157, 1995.
6. Pezet D, Fondrinier E, Rotman, et al.: Parietal seeding of carcinoma of the gallbladder after laparoscopic cholecystectomy. *Br J Surg* 79:230, 1992.
7. Mouiel J, Gugenheim, Toouli J, et al.: Port-site recurrence of cancer associated with laparoscopic diagnosis and resection: the European experience. *Semin Laparosc Surg* 2:167–179, 1995.
8. Greene FL: The impact of laparoscopy on clinical staging: A worldwide perspective. *Int Surg* 79:217–220, 1994.